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December 17, 2018

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

Re: Docket No. RM-11821, *Sennheiser Electronic Corporation, Request for Amendment of Part 74 of the Commission's Rules to Advance the Use of Spectrum Efficient Wireless Microphone Equipment*
***Ex Parte* Communication**

Dear Ms. Dortch:

On behalf of Sennheiser Electronic Corporation, I am electronically filing this courtesy notice of an oral *ex parte* communications in the above-referenced docket.

On November 1, 2018, Joe Ciaudelli, Jan Watermann, and Andreas Wilzeck of Sennheiser and I met with Julius Knapp, Hugh van Tuyl, Ira Keltz, Paul Murray, Walter Johnson, Blaise Scinto, Rashmi Doshi (by teleconference) of the Commission staff.

We demonstrated Sennheiser's Wireless Multi-Channel Audio System and presented the attached slide deck.

Slide 7 in the attached shows an 8 MHz system of the kind authorized for use in Europe. The rulemaking petition describes, and seeks rules to authorize, a 6 MHz system consistent with U.S. frequency usage. Sennheiser demonstrated the 6 MHz bandwidth version and mask compliance during the meeting.

Please do not hesitate to contact me with any questions.

Respectfully submitted,

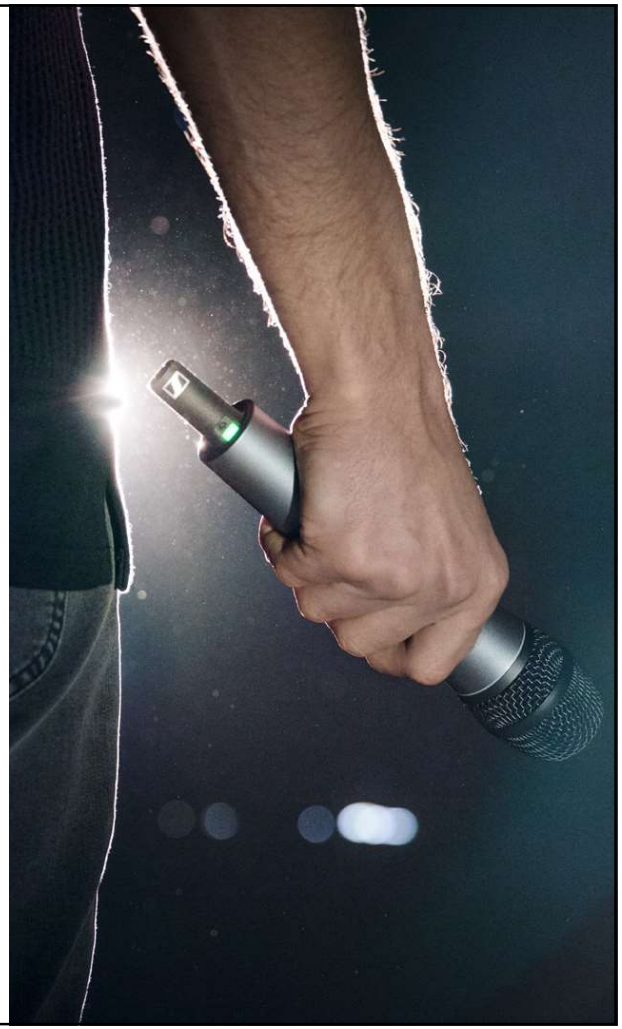
Mitchell Lazarus
Counsel for Sennheiser Electronic Corporation

cc (by email): meeting participants

1ST NOVEMBER 2018

Wireless Multichannel Audio System Demonstrator (EN 300 422 WMAS)

SENNHEISER



Sennheiser at a Glance

Global Headquarters

New Mexico Factory

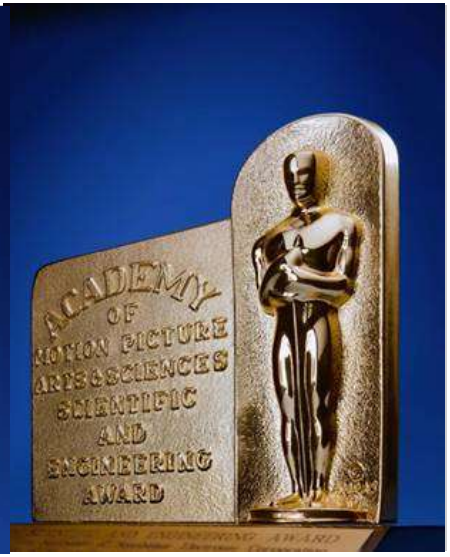
- Founded in 1945
- Workforce of more than 2000 people all over the world
- Annual sales approx. $800 million
- Production sites in Germany, Ireland and the USA
- International network of subsidiaries and distribution partners

- Three U.S. Facilities:
  - Old Lyme, CT: Sales & Marketing
  - San Francisco, CA: Advanced R&D
  - Albuquerque, NM: Factory
    - Primary plant for production of wireless microphones for Americas, Asia. Australia/NZ

Awards

- Emmy Award
- Technical Grammy
- Academy Award

Sennheiser is the leading manufacturer in high end profesional wireless mics. More than 90% of mics used on Broadway are Sennheiser



Outline

- Advantages of Broadband Transmission Scheme
- EN 300 422 WMAS Mask
- Current Status

Advantages of Broadband Transmission Scheme

- **Spectral Efficiency**
  Currently available professional systems can operate 12 high-fidelity audio channels per 6 MHz.
  WMAS enables 18 to 64 audio channels, depending on audio quality, latency and range requirements.

- **RF Fading**
  Narrowband transmission suffers from strong RF fading, while broadband transmission utilizes the best performance out of constructive and destructive reflection paths.

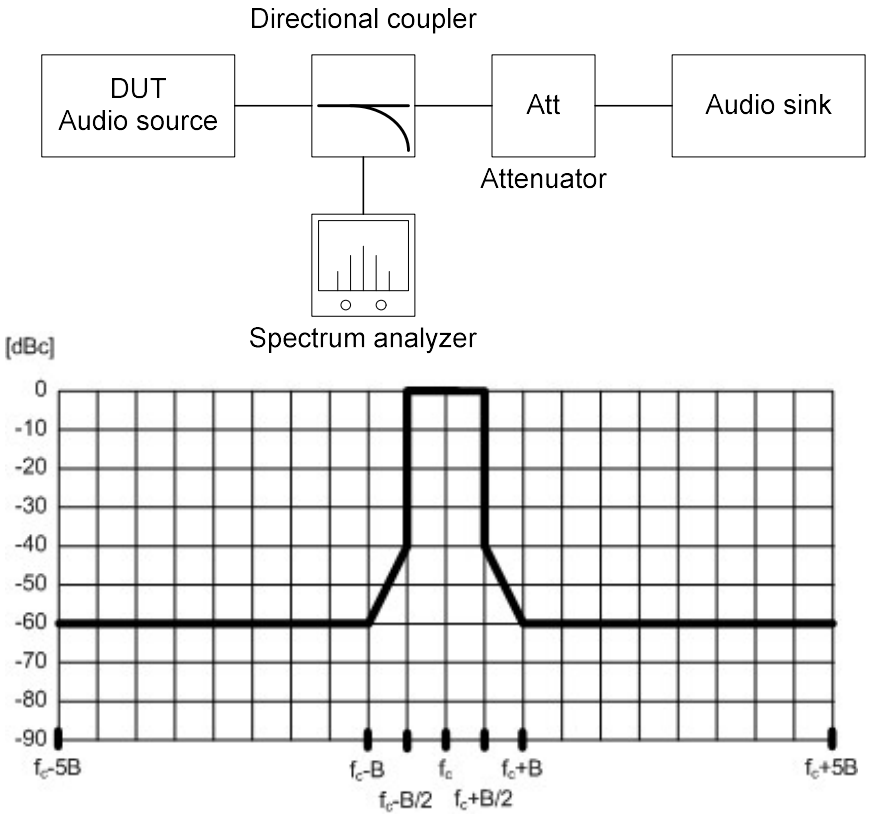
- **Scalability**
  In terms of RF robustness, audio quality, and number of audio channels.

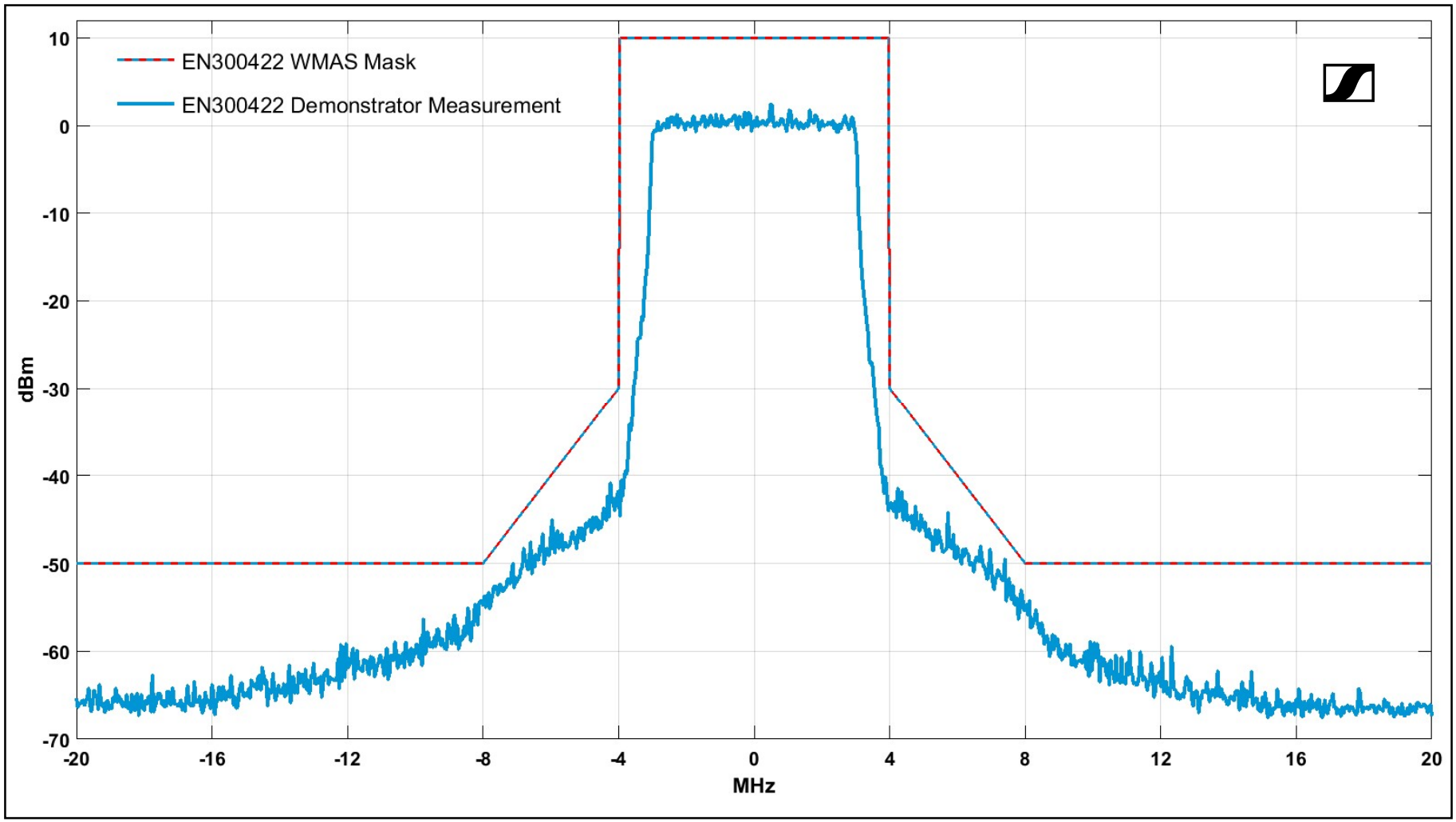
- **Flexibility**
  Bidirectional communication within the same RF channel. Full remote control and flexibility to use microphone and IEM channels.

- **Compatibility with adjacent services**
  All transmissions centrally managed.
  Significantly reduced power spectrum density (-14,7 dB @ 6 MHz) compared to legacy technology.
  Complies with EN 300 422 spectral mask.

EN 300 422 WMAS Mask Measurement Setup

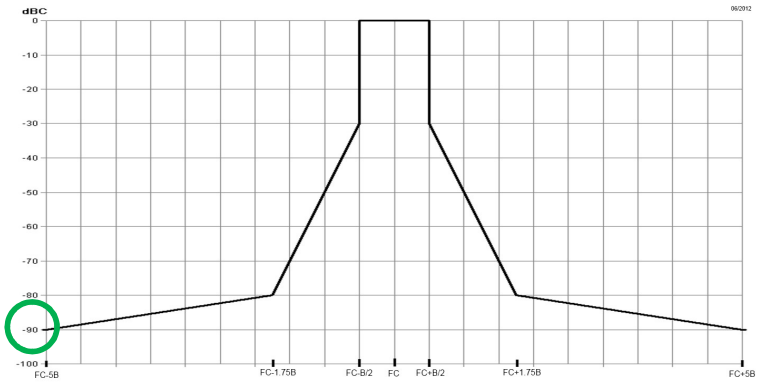
- RBW 100 kHz
- VBW ≥ RBW
- Detector Max Peak
- Trace Mode Max Hold
- Measurement time ≥ 60 s
- Sweep time ≤ Meas. time



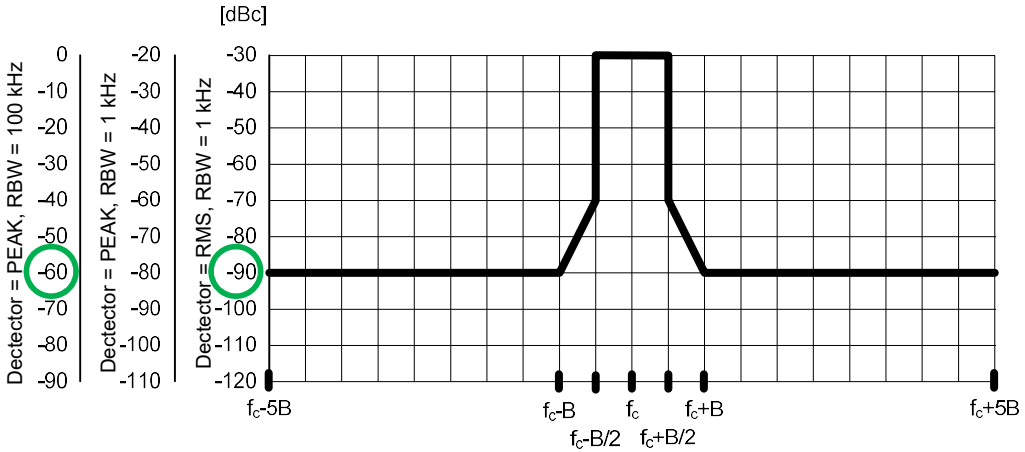

EN300422 WMAS Mask
EN300422 Demonstrator Measurement
dBm
MHz
10
0
-10
-20
-30
-40
-50
-60
-70
-20
-16
-12
-8
-4
0
4
8
12
16
20

EN 300 422 WMAS Mask
Comparison with Narrowband Transmission Mask

Digital Narrowband Transmission Mask



WMAS Transmission Mask



➔ Narrowband mask of -90dBc (RMS + RBW 1kHz) is comparable to WMAS mask at -60dBc (PEAK + RBW 100kHz)

Current Status

- **Standardization.**
  - WMAS are standardized under EN 300 422.
- **Regulation.**
  - CEPT applied changes to ERC Rec 70-03, removing 200 kHz bandwidth limit. European countries currently updating their national regulations accordingly.
  - Several Asian countries including China have agreed to enable WMAS in their markets.
  - We kindly request Federal Communications Commission to amend its rules to permit WMAS technology in the US market. Specifically lifting the 200 kHz bandwidth limit. Filed a Petition for Rulemaking on August 17, 2018.

Thank you!

Contact:

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